REAUTHORIZATION OF THE SMALL BUSINESS TECHNOLOGY TRANSFER PROGRAM (STTR)

HEARING

BEFORE THE

SUBCOMMITTEE ON RURAL ENTERPRISES, AGRICULTURE, AND TECHNOLOGY

AND

SUBCOMMITTEE ON WORKFORCE, EMPOWERMENT AND GOVERNMENT PROGRAMS

OF THE

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THE SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM

WEDNESDAY, JUNE 20, 2001

HOUSE OF REPRESENTATIVES, SUBCOMMITTEE ON RURAL ENTERPRISES, AGRICULTURE, AND TECHNOLOGY AND THE SUBCOMMITTEE ON WORKFORCE, EMPOWERMENT AND GOVERNMENT PROGRAMS

Washington, DC.

The subcommittees met, pursuant to call, at 3 p.m. in room 2360, Rayburn House Office Building, Hon. John Thune (chairman of the subcommittee) presiding.

Chairman THUNE. This hearing will come to order finally, and I apologize to our witnesses. Sometimes the Floor schedule gets a little bit in the way of the business we are trying to conduct around here, but that is the business we are trying to conduct.

But let me just say good afternoon. It is a pleasure to welcome all of our witnesses to our joint hearing between the Subcommittee on Rural Enterprises, Agriculture and Technology and the Subcommittee on Workforce, Empowerment and Government Programs.

Today's hearing has been called to discuss the Small Business Technology Transfer Program, which is up for reauthorization this year.

The technology transfer program, commonly known as STTR, was created in 1992, for the purpose of utilizing the vast reservoir of commercially promising ideas at our nation's research institutions. Authorization for this important small business program expires in September, and it is the committee's intent to work with the Senate Small Business Committee to reauthorize this important program by September 30 of this year.

The STTR is a competitive federal grant program that reserves a specific percentage of research and development dollars for small businesses and their nonprofit research institution partners.

The success of STTR is that it requires a cooperative venture between a for-profit small business and a researcher from a university, federal laboratory, or a nonprofit research institution for the purpose of developing commercially viable products from ideas spawned in a laboratory environment.

While the Small Business Administration is the coordinating agency for STTR, five federal departments and agencies actually implement STTR, and designate research and development projects and accept proposals from the private sector. These agencies—Department of Defense, Department of Energy, Department of Health and Human Services, National Science Foundation, and the Na-

tional Aeronautics and Space Administration—reserve a portion of their R&D funds to award contracts to STTR partnerships.

This program has enjoyed a wide range of success and the small business and research communities are very supportive of its continuation.

The STTR has helped create new jobs and stimulate our economy by bringing new technologies to the marketplace and helping new business ventures develop into stable small businesses.

As a representative from a rural state, I can tell you that job creation is vital to the small communities in South Dakota. The establishment of just one new small business makes a huge difference on main street. A small business with 100 employees in a town adds on average 351 more people, 79 more school children, 97 more families, $490,000 more in bank deposits, $565,000 more in retail sales per year, and over $1 million more in personal income per year.

I want to again thank the witnesses for appearing before the two subcommittee today, and we will look forward to your testimony, and I would now yield to Ms. Millender-McDonald for an opening statement if you choose to make one.

Ms. MILLENDER-MCDONALD. That is okay. Thank you, Mr. Chairman, and it is indeed a pleasure to see all of you here today. We thank you so much for you indulgence. We do have to do the peoples' business in a different sense than having hearings.

But today I am pleased to participate in this timely hearing on Small Technology Transfer Program. Technology and its associated applications is the engine that is driving our economy. But it is important to remember that small businesses have fueled the recent economic expansion and they serve as the conduit to delivery of service and good in the twenty-first century.

Virtually nothing we do on a daily basis remain unaffected by technological growth and/or research and development. In our homes, we use programmable microwaves, in addition to advanced technology related to personal medical devices. Our cars have global positioning systems, and our portable phones allow us to access the internet. Indeed, we have entered into a new and exciting frontier.

This new frontier, however, must be navigated and that is our purpose today; to examine how the STTR Program administered by the SBA is enabling and supporting the interest of our economy and small businesses.

The STTR was designed to address the lack of capital that small business research firms experience. It achieves this objective by partnering small firms with private research institutions, federally funded R&D centers and/or nonprofit organizations.

I am particularly interested in determining what can be done to enhance partnerships between private research institutions and minority and female-owned small businesses.

As the September 30 deadline for reauthorization approaches for STTR, I am concerned about whether this program is doing enough to meet the needs of the small business research and development sector. I am very curious about why of the 864 STTR awards from FY–1994 through FY–1998, only 13 or 1.5 percent were to women-

owned businesses, and why only 2.8 percent went to minority-owned businesses.

While I acknowledge the strides that have been made regarding partnerships between historically black colleges and universities, minority institutions and SBA, so much more needs to be done, and I am looking forward to listening and hearing that today, hopefully.

Therefore, I am very interested in determining what has to happen in order to assist small businesses to gain access to opportunities that much larger companies enjoy.

I also want to explore why inner-city, especially my district of Watt and Coemption and Lynwood, and the rural communities of my colleagues and friends on this dias with me are being left behind in technology partnerships that are occurring.

So I look forward to all of you speaking to us today and talking with us and hopefully we can come to resolves that will be positive.

And thank you, Mr. Chairman.

Chairman THUNE. I thank the gentlelady for her statement. And the Chair now recognizes the gentleman from New Mexico, who is the ranking member on the Subcommittee on Rural Enterprises, Agriculture and Technology, Mr. Udall.

Mr. UDALL. Thank you, Chairman Thune, and Ranking Member Millender-McDonald, and thank you members of the panel for being here and indulging us and your patience during the vote, and I know the long wait here.

I appreciate being here today to participate in this joint subcommittee as we review the Small Business Technology Transfer Program scheduled to be authorized by September 30, 2001.

The STTR Program is designed to address the lack of capital that small business research and development firms experience when getting started. Another unique aspect of the program is that small businesses can partner for research projects with research institutions, federally funded research and development centers or nonprofit organizations.

It is my hope that through today's hearing we can, if possible, identify what works within the STTR Program and what does not work or what needs improvement. My concerns lie around the limitation of the STTR Program and its project funding, assistance.

As Ranking Member Millender-McDonald has said, minority and women-owned businesses and assistance to rural and low-income areas. And what astonishes me is that in fiscal year 1994 through 1998 there were 31 STTR grants awarded in New Mexico. Of the 31 awards, only four were awarded in my congressional district and none were awarded in the second congressional district, which is also predominantly rural. For fiscal year 1999, one STTR grant was awarded in New Mexico.

Basically, of the grants awarded in my state, my congressional district received only 13 percent of the grant funding; in the second district, no grants were received; and yet the first district, which is the urban one, received 87 percent of the funding.

My district is rural, has a large number of low-income areas, a high amount of minority- and women-owned businesses. Although the SBA has been creative in developing initiatives to expand the STTR Program in rural and low-income areas, something is obviously not working.

Mr. Chairman, I look forward to hearing from the panel today on their concerns with the STTR Program. I hope we can leave here today with a better understanding of what Congress needs to do to improve the STTR Program. We can all agree that this program is a valuable tool to assist small business owners who focus on research and development initiatives. However, there is still work to be done.

Thank you.

Chairman THUNE. Thank the gentleman for his statement. Any additional statements members care to make?

Before we begin receiving testimony from the witnesses, I do want to remind everyone that we would like each witness to keep their oral testimony to five minutes. In front of you, you will see a little box there on the table which will cue you with the red light—when five minutes time has expired. You will get a yellow light when there is a minute left, so it should be fairly self-explanatory, and rest assured there is no trap door if you go over that time. Your entire statements, if you have written statements, will be included as part of the hearing record.

So let me just briefly, if I might, introduce the witnesses and we will get underway. Our first witness today is Mr. Maurice Swinton who is the Assistant Administrator for the Office of Technology at the Small Business Administration. Mr. Swinton is responsible for direct oversight of the STTR Program, and then we will move to the next witness.

So, Mr. Swinton, please proceed.

STATEMENT OF MAURICE SWINTON, ASSISTANT ADMINISTRATOR, OFFICE OF TECHNOLOGY, SMALL BUSINESS ADMINISTRATION

Mr. SWINTON. Thank you, Mr. Chairman.

Good afternoon to the Chairman, and distinguished members of the subcommittees. Thank you for inviting me here today. I am pleased to discuss the Small Business Technology Transfer, or STTR, Program. I manage the STTR Program and the Small Business Innovation Research Program, or SBIR, Program, and the newly authorized Federal and State Technology Partnership Program.

In 1992, Congress enacted Public Law 102–564, which authorized STTR as a companion program to SBIR. Despite SBIR's success, Congress felt that more could be done to link small businesses with creative ideas at universities, nonprofit scientific and educational institutions, and federal laboratories. This collaboration would result in a better commercialization rate for federally sponsored research conducted at nonprofit institutions.

Both programs share the same philosophy—use federally funded research and development requirements to promote technological innovation by small businesses and strengthen the American economy.

Like SBIR, the STTR Program is structured in three phases. Phase I in the STTR Program is to evaluate the scientific, technical and commercial merit of an idea and it is funded at $100,000 for a one year period. Phase II funds Phase I projects that have the most potential for further development and it funds them at

$500,000 for two years. Under Phase III, no federal STTR funding is provided. Private sector support is used to bring the innovation to the commercial marketplace.

The ten participating agencies in the SBIR program have research and development budgets greater than $100 million and are required to reserve 2.5 percent for their SBIR programs. Conversely, the five agencies participating in the STTR Program have research and development budgets greater than $1 billion, and must reserve .15 percent for their STTR programs.

The STTR goes beyond the SBIR program. It involves cooperative research and development performed jointly by a small business and a research institution.

Although the project is a joint effort, the small business exercises overall management, control and responsibility for the project.

In its eighth year of operation, the STTR Program continues to meet its objectives and impacts innovation and commercialization of products and services. In FY1999, participating agencies issued 329 awards to small technology firms, totaling over $64 million. For the past four years, the program has provided an average of $65 million annually for small businesses and their research partners to accomplish the research needs of the agencies.

Since the inception of the program, over $198 million has been awarded to 1100 small businesses, and over 250 universities have partners with small, innovative firms to conduct STTR research projects. These firms provide jobs and economic growth in most states.

The SBA plays a major role in the STTR Program. We establish program policy, monitor agencies compliance, and report annual STTR Program activities to Congress. SBA is also the information link to agencies' research topics. We collect solicitation information from them and publish quarterly updates on SBA's web site.

Through the Rural Outreach Grant Program, we have been successful with working with states. This program provides 25 states an opportunity to increase their participation levels in the programs. These states met the criteria established in Public Law 105–135 as states receiving less than $5 million in funding during fiscal year 1995. They also showed a low participation rate in the SBIR and STTR programs. Attached to my written testimony is a list of the 25 states.

The SBA has also been very successful through its innovative initiative to increase the participation levels of small disadvantaged businesses and minority educational institutions in the program. The SBA, along with other federal agencies, has provided a series of SBIR and STTR seminars and workshops for these entities.

Assessments of the program have been favorable. The 1996 GAO review of the program found that the technical quality of the STTR proposals have potential for commercialization.

Authority for the STTR Program expires on September 30 of this year. The Administration supports reauthorization of the program for a three year duration, and no increase to the percentage set aside for the program. The Administration also will support an increase in the Phase II award level to $750,000.

Thank you for the opportunity to appear before you today. I will be happy to answer any questions you may have.

[Mr. Swinton's statement may be found in appendix.]

Chairman THUNE. Thank you, Mr. Swinton. I appreciate your testimony and would also note for the record, Mr. Udall noted the number that New Mexico—I was just looking at the chart here. South Dakota has received one STTR Grant. So we have got a lot of room to grow there. We do not like being last in that category. We do not mind being last in crime and some other categories, but we want to move up.

Our second witness is Mr. Tim Foreman who is the acting director of the Small and Disadvantaged Business Utilization Office at the Department of Defense.

So, Mr. Foreman, please proceed.

STATEMENT OF TIM FOREMAN, ACTING DIRECTOR, SMALL AND DISADVANTAGED BUSINESS UTILIZATION OFFICE, DEPARTMENT OF DEFENSE

Mr. FOREMAN. Thank you, Mr. Chairman. Thank you distinguished members. It is a pleasure to be here this afternoon to talk to you about the Small Business Technology Transfer Program, which we term the STTR Program.

The thrust of the program is designed to bring the research and development and engineers at the institutions, educational institutions, and I should tell you who they are. They are basically universities, federal funded research project centers, as well as nonprofit research institutions together small business concerns.

And you get the entrepreneurial spirit of the small business, and you bring in these new innovative ideas. And we have found in the Department of Defense it is extremely helpful and supporting our military movements in the research and development efforts.

I am not going to read it. I am just going to have my statement, if I would, put into the record, but sum up some of the interesting things that I think we should note.

We do support the extension of the Small Business Technology Program. Hopefully, it is going to be reauthorized. What the administration's position is is to maintain the current level of funding; that is, .15 percent based—basically pending what we are going to be looking at under Secretary Rumsfeld's strategic review.

We do not—again contingent upon that strategic review, the information that we have does not support the movement from 1.5 percent to three percent because the data just does not support that there is merit in those dollars at the current funded level.

So with that I will try to get us back on time, and I thank you, and I am very pleased to take any questions.

[Mr. Foreman's statement may be found in appendix.]

Chairman THUNE. Thank you, Mr. Foreman, and I think next up, at least in the order in which you are sitting there, and this is our last government witness, is Jo Anne Goodnight from the National Institute of Health. Ms. Goodnight, who has 16 years of government service, is currently the SBIR and STTR Program Coordinator for the Public Health Service and the National Institutes of Health.

And I will also note that we have been joined by the gentleman from Illinois, Mr. Phelps, and ask Ms. Goodnight to proceed.

STATEMENT OF JO ANNE GOODNIGHT, PROGRAM COORDINATOR, NATIONAL INSTITUTES OF HEALTH, DEPARTMENT OF HEALTH AND HUMAN SERVICES

Ms. GOODNIGHT. Thanks. Can I buy his three minutes he didn't use. Just kidding.

Good afternoon. On behalf of the National Institutes of Health, I am pleased to have the opportunity to testify before you today on the reauthorization of the STTR Program.

Due to the size of our extramural budget, NIH is the only component within the department that participates in the STTR Program, and our budget now constitutes the second largest amount of SBIR and STTR funding available across the federal government.

The STTR Program, like the SBIR Program, is well integrated within the overall scientific programs and goals of the NIH. It has enhanced collaborative efforts between the small business research community and the academic research community. These collaborations may be initiated either by researchers at the small business concern or the research institution.

It is collaborative opportunities such as these that are most likely to result in innovative projects that have the greatest commercial potential and societal benefit.

Though STTR is a much younger program than the SBIR program, a number of NIH STTR projects have already resulted in significant improvements to our nation's health and an increased productivity of other researchers.

I would like to discuss two successes in particular. Vaxin, Incorporated, of Birmingham, Alabama, developed a needle-less vaccine technology. STTR resulted in the development of a novel tetanus vaccine, and Vaxin is currently developing similar vaccines against a wide variety of infections or cancers, all targeted toward painless, needle-less administration using a skin patch.

Idaho Technology, through NIH STTR funding, developed a thermal cycler machine. The LightCycler, which is tied to a process called polymerase chain reaction, can multiply and analyze strands of DNA and RNA ten times faster than the equipment that most research labs are using. In six years, IT has grown from a six-person start-up company to a firm today that employs 65 scientists and engineers, and sells a growing range of instruments and reagents.

The IT company president states, "The STTR program gets much of the credit for this growth. Without the initial Phase I grant, we would not have developed the product that has brought us commercial success. The STTR program benefited us by providing that seed capital to prove principle on a high-risk project, and a structure for collaboration with the University of Utah."

The NIH attributes the success of our STTR and SBIR programs to several factors, the most significant of which is flexibility in our administration of the programs. What has made them so appealing are the opportunities presented multiple times a year for firms to propose innovative R&D projects with truly revolutionary outcomes rather than restrict the ideas to projects that can only be conducted under a prescribed amount of time and money.

Our experience is that the conduct of certain types of biomedical and behavioral research, such as nano technology, clinically-related studies, vaccine development, and drug discovery, does not routinely lend itself to prescribed maximum time and dollar levels. These are exceptions, but such projects can be important steps in integrally involving small businesses in some of the most exciting, cutting-edge research.

Mr. Chairman and committee members, having provided a brief overview of how NIH has utilized the STTR Program and benefited from it, I would now like to address two important areas related to these programs.

Although the programs share common threads, NIH believes that the STTR Program serves a very important function and one different than the SBIR Program. While SBIR is a vehicle for harnessing innovative ideas in the private sector, STTR taps a pool of technological innovations in our nation's research institutions.

STTR stimulates tech transfer by providing an effective mechanism for academicians to partner with a firm to pursue a commercially promising idea that would otherwise languish on the shelf. While academic researchers may play a consultant or collaborative role in an SBIR project, they can't participate in the SBIR program in a significant way as long as their primary employment is with the research institution.

Therefore, STTR makes a significant difference to an academic researcher who desires to be an entrepreneur but finds it unfeasible to leave the research institution to start a small business. STTR is a promising program and NIH supports its continuation. We are taking steps to further enhance the program with a particular focus on narrowing the funding gap between Phase I and II, and improving our outreach activities.

We have established a Phase I, Phase II Fast Track option designed to expedite the decision and award of Phase II funding. We realize that Fast Track is not appropriate for all types of research, therefore we have provided alternative options to bridge the funding gap, such as an extension in time with or without funds and allowing Phase II applicants to submit on any of our three annual receipt dates.

In addition, we encourage our awardees to seek potential state matching resources. We realize that outreach is critical to the success of the STTR and SBIR Program. Each year we host an SBIR/STTR conference on the NIH campus. In addition, we participate in three national SBIR and STTR conferences, at least one of which is held in a rural state. And we participate in numerous regional and state conferences. We will continue our efforts to raise awareness about STTR and SBIR funding opportunities in state and research institutions within them.

In conclusion, NIH is very pleased with its involvement in the STTR and SBIR Programs, and I would be happy to answer any questions you might have about our participation in them.

Thank you.

[Ms. Goodnight's statement may be found in appendix.]

Chairman THUNE. Thank you.

Mr. GRUCCI [presiding]. Next we will hear from Dr. Walter Polansky of the Office of Science at the Department of Energy.

STATEMENT OF WATER M. POLANSKY, OFFICE OF SCIENCE, U.S. DEPARTMENT OF ENERGY

Mr. POLANSKY. Good afternoon. Thank you, Mr. Chairman, distinguished members of the Committee.

I appreciate the opportunity to come before you today to discuss the Department of Energy's Small Business Technology Transfer Program, STTR. Over the past seven years, I have been responsible for management oversight of the department's STTR activities at DOE.

Let me begin by giving a brief glimpse of STTR from a DOE perspective, the size of the program, some of the benefits that we see the program is giving us, and also maybe a recommendation for you to consider as you work on reauthorizing legislation.

First of all, the size of the program. Over the past seven years, we have received over 1,300 Phase I applications for STTR projects. We have awarded about 115 Phase I grants. Of those Phase I grants, approximately 40 of those were turned into Phase II activities.

And as you know, an STTR project calls for a collaboration with a nonprofit research institution. Our numbers shows that there is a breakout of about 50 percent of the nonprofit research institutions are Department of Energy laboratories. The other 50 percent are universities.

In the early stages of the program the small businesses would partner primarily with DOE laboratories. The latter stages of the program, there is a switch to partnering with universities.

The program has produced a number of benefits, but because the program is relatively young and relatively modest in size, we can only provide anecdotal information. However, let me just mention three projects that were beneficial not to only to the small business, but also to the Department.

The first example is a project with Plasma Processes at Huntsville, Alabama, in collaboration with the Lawrence Livermore National Laboratory in Livermore, California. The success from the small business perspective was as a result of this project they were able to reap approximately $1 million in sales for a plasma deposition technique which has commercial applications. From our perspective, it provided us a new technology to use in fusion research.

Another example is the Hy-Tech Research Corporation in Randford, Virginia. They reported a follow-on contract with Caterpillar related to another deposition process and associated diagnostics. This resulted from a 1999 STTR project with the Lawrence Berkeley National Laboratory, and again it has applications in the Department's fusion research programs.

The third example is in the information technology area. The Jorway Corporation in Westberry, New York, collaborated with Yale University, and developed a new standard for high-speed data transfer.

The STTR Program at DOE, received over 650 grant applications the first two years of the program. However, the number of applications dropped precipitously to about 150 proposals for 1998 and 1999 combined.

We reversed this trend by issuing the SBIR and the STTR solicitations together. We permitted the small businesses to submit an

STTR grant to any of the SBIR topics, and we provided the small businesses with the opportunity to be considered for an award under both programs.

As a result of that action, the number of grant applications we received under STTR basically doubled from the 1998 and 1999 number, to about 300.

As you are considering reauthorizing the legislation, we would encourage you to consider raising the Phase II award amount for STTR from $500,000 to $750,000, which would put it on par with the SBIR Program. We feel that the current level of $500,000 for an STTR Phase II award is actually a disincentive to small business because under the STTR Program the small business must partner with a research institution and share part of that award.

I would like to thank you again, Mr. Chairman, and distinguished members of the committee, for the opportunity to discuss the STTR Program at the Department of Energy, and I am pleased to answer any questions you may have.

[Mr. Polansky's statement may be found in appendix.]

Mr. GRUCCI. Thank you.

Next, the committee will hear from Mr. Anthony Camarota, President of Avtec Industries from Hudson, Massachusetts.

Avtec Industries has successfully utilized the STTR Program, and the committee looks forward to your testimony, sir.

STATEMENT OF ANTHONY CAMAROTA, PRESIDENT, AVTEC INDUSTRIES

Mr. CAMAROTA. Thank you, Mr. Chairman.

Mr. Chairman, member of the committee, I am Tony Camarota, President of Avtec Industries located in Hudson, Mass. I would like to thank all of you today for the invitation to testify. We have some very specific comments to make about the Small Business Technology Transfer Program.

Firstly, I would like to express my gratitude and that of the thousands of other small business owners to the committee for initiating and supporting the STTR Program in 1992, and for its continued support of the program over the years. It has consistently been a benefit to the small business community and to the nation.

While Avtec is a relatively young enterprise and it has just begun to mine the promise of promise of this program, I am here today to offer you an amalgam of comments from small business owners like myself from around the nation. Among these are Wilson Composite Technologies of Folsom, California; Brewer Science, Incorporated of Rolla, Missouri; and Foster-Miller, Incorporated of Waltham, Massachusetts.

Avtec is in a unique position in that we are exemplary of the kinds of firms that seek to mine university research and bring it to market. We rely heavily upon university researchers and their expertise to help us to perfect the products we produce and to conduct the tests and related qualification work that is necessary in order to gain product acceptance.

Avtec was founded in 1998. Its founding heralded the commercialization of a family of fire resistant coatings and resin additives that have had their origin in the development of aerospace products.

Our products are currently being examined by firms engaged in manufacturing of fiber optic cables, turbine engines, commercial and military aircraft, civil and military maritime structures, including oil and gas drilling platforms and ships.

In the last year, we signed 22 nondisclosure and teaming agreements and 425 restricted sample utilization agreements with Fortune 1,000 firms involving the testing and certification of our products.

We have three manufacturing cites, two in Massachusetts and one in New Hampshire. We manufactured an ISO 9000 standards and distributed our products in the United States, Europe and Asia.

The STTR Program is a program that enabled us to meet the myriad needs of this diverse customer base. As you might imagine, small firms such as ours lack the facilities and in-house experience necessary to meet all of today's demanding marketing requirements. The STTR Program enables us to foster the relationships we need, and more importantly, to obtain the resources we must have to remain competitive.

By way of example, a DoD funded not-for-profit institution is teaming with us in pursuit of an Advanced Technology Program award administered by NIST. We are also teamed with a prominent local defense contractor in pursuit of several of SBIR grants. And finally, we are teamed with one of the nation's premier materials and engineering schools involving other federal R&D programs.

I would like to make six recommendations today that I feel will enhance the STTR Program.

First, increase the STTR funds base from .15 percent to 1.5 percent of a participating agency's extramural budget.

Secondly, increase the Phase II awards to $750,000. This brings the program into alignment with the true cost of research and development activities.

Thirdly, increase the industry participation criteria from a minimum of 40 percent to between 50 and 60 percent.

Fourth, ensure that project reviewers place equal emphasis on the commercialization plan as well as they do on the research plan.

Fifth, require that universities, government laboratories, and not-for-profit institutions treat STTR research projects as company confidential business information unless otherwise released from this obligation by their business partner.

Sixth, to the extent possible, SBA and STTR program offices should provide small businesses with examples of successful strategies that resulted in the universities, government labs and not-for-profit institution partners having to adhere to a schedule, stay within budget, and delivering what has been asked for in the research component of the program.

In this vein, SBA and the program offices should be encouraged to impress upon their partners the need under this program to adhere to these principles.

I believe the first two recommendations speak for themselves, so I will not elaborate on them other than to say that we strongly support the program and wish to see it expanded.

With respect to the other recommendations, I would like to elaborate briefly.

Teaming with the universities and their research partners makes it difficult at times for the small business owner. In all our dealings with work with universities such as the University of Massachusetts at Lowell, the University of Missouri at Rolla, MIT and other diverse institutions. Our primary focus is on near-term answers to pressing technical matters, but we also use this relationships to seek out promising early-stage university research.

And while the time-to-market between our products and their research may be enormous, we are patient pursuers. Our success, while encouraging, have been augmented through programs such as this for it has led to relationships with large firms we might not have otherwise have established.

The STTR Program which focuses on university-funded research could also work well for firms such as ours in the area of providing increased access to university resources not currently commercial.

I know I am running a bit late but I would like to close with one last point.

At a time when Congress is seeking a greater return on investment from the commercialization of technologies, our collective recommendation is to increase the proportion of the small business share to between 50 and 60 percent. We make this recommendation because the full-force of the commercialization burden rests upon our shoulders. Our colleagues in the university and other research institutions are the guiding lights when it comes to technology development, and for that they must certainly deserve praise. But the demands of Congress and the marketplace have increased our burden so we feel that the time is right for a change in the resource allocation formula.

I would like to thank the committee for allowing me to speak today. I would be pleased to answer any questions you might have.

[Mr. Camarota's statement may be found in appendix.]

Mr. GRUCCI. Thank you, sir. We appreciate your testimony, and I believe we are now all caught up on the time.

At this point, the committee will now hear from Mr. Richard Carroll, CEO of Digital Systems Resources in Fairfax, Virginia.

Mr. Carroll's company has participated in the STTR Program in the past, and we welcome your remarks, sir.

STATEMENT OF RICHARD W. CARROLL, CHIEF EXECUTIVE OFFICER, DIGITAL SYSTEM RESOURCES

Mr. CARROLL. I want to first thank the Chairman and the ranking minority members and the committee for the opportunity to testify about my company's experience with the SBIR and STTR Programs, and I will combine them because my experience is with both, but I understand this is an STTR hearing.

My name is Richard W. Carroll, and I am the CEO of the company Digital System Resources, Inc. (DSR). While I have a chance, I also would like to just extend a compliment to the SBA, the DoD, the NIH, the other individuals testifying here as well as the other agencies. I think the SBIR and STTR Programs are really well run government programs, and I take the opportunity to compliment

the bureaucracy in putting forth such good programs for our community.

Our company over the past 15 years has won a number of SBIR and STTR Phase I and Phase II competitions, and that has resulted in commercialization of a number of efforts. And I would like to say that without the SBIR Program and STTR Program this could not have happened. These opportunities do not exist other places in the government that I know of for companies like mine.

As I am sure the committee is aware, over the past decade the marketplace has changed a great deal, and in particular, the defense marketplace is the market I know the best, and so most of my comments will be applicable with my experience with the defense marketplace.

Overall, the defense budgets have been cut and funding for research and development has also been sharply reduced. And in this much smaller defense marketplace, we see even the largest defense contractors competing aggressively for even the smallest parts of advanced technology research and development dollars.

On the other hand, the defense technology environment has changed radically in ways that should make it more suitable for small business solutions. So while the market has gotten more competitive and difficult, the market also offers better solutions for the Department of Defense.

A revolution in technology is taking place in the private sector, fueled by innovative, small high-technology businesses, and the private sector has overwhelmingly demonstrated that you do not have to be a giant manufacturer of complex systems in order to provide innovative solutions to complex problems.

I will also comment that geographically, you do not need to be located in the centers of industry to be able to provide those solutions, in keeping with the comments made by a number of the other committee members.

The SBIR and STTR Programs are now more essential than ever. They offer a unique and effective structure for introducing advanced technology solutions developed by small businesses in the defense marketplace. They offer a "fly before you buy" approach that gives small businesses seed money to rapidly develop and demonstrate viability of advanced technology concepts before any commitment is made to purchase the technology. In addition, these programs provide small business projections and follow-on procurement opportunities that ensure enthusiastic and motivated small business participation.

Our experience in the STTR Program, in particular, has been very similar to that in the SBIR Program. We have relied more heavily on the SBIR Program because it is a bigger program. There are more opportunities.

We successfully teamed with Duke University in Durham, North Carolina, on an STTR effort to develop composite embedded antennas for electronic warfare for our surface ships. We won both Phase I and Phase II contracts with Duke, developing the antenna hardware, and DSR developing the application software.

The characteristics of the STTR relationship in our case was to bring the basic research orientation of Duke together with the applied technology focus of our company which was seeking to market

the technology to DoD. This partnership stimulates out-of-the-box thinking at both the university and the company through mutual exposure to new ideas that might not naturally germinate in our respective environments, and we firmly believe that this partnership can stimulate the transition from basic research in the university environment into the commercial marketplace.

An added benefit for our company is the direct access to a proven source of professional talent, and we provide students working on STTR projects with employment opportunities in their chosen fields at their locations.

The STTR Program is a natural complement to the SBIR program in that it generally involves more basic research while still providing all the advantages and opportunities that come from the SBIR program.

And in closing, I would like to compliment the committee for its unwavering support of both the SBIR and STTR Programs. These programs are essential to give small businesses a realistic opportunity to compete in the defense marketplace, and I believe that without these two programs injection of small business innovation into the Department of Defense would be virtually impossible.

I do have a couple of recommendations that I would like to put forth.

Certainly the observation that these projects, which are administered very well by this bureaucracy, is generating thousands of competitive alternatives to incumbent positions and incumbent elements of our research community, and that is a very healthy things. We ought to do all we can to foster these competitive alternatives on an ongoing basis to be given consideration for incorporation into the mainstream marketplaces, both federal and commercial.

I do support an increase in the program. I think this program can handle an increase and continue to generate innovation. And I would like to thank the committee again for the opportunity to testify.

[Mr. Carroll's statement may be found in appendix.]

Mr. GRUCCI. Thank you all.

I am going to break with protocol, if I may, and I am going to allow the two ranking members, since they have a little bit more seniority on these two committees than I do, to offer the first rounds of questions, and we will start with Ranking Member Millender-McDonald, Ms. Millender-McDonald.

Ms. MILLENDER-MCDONALD. Well, thank you so much, Mr. Chairman. I suppose you should be here all the time because the chairman of the full committee does not do such a thing.

Mr. GRUCCI. Now, now.

Ms. MILLENDER-MCDONALD. I thank you all for coming and to express your interest in increase in funding for these programs. I have some questions as I have tried to go through this myriad of paperwork that we have up here, and I'll start with the Administrator, Mr. Swinton.

It has been noted that the STTR, along with the SBIR, together can really be the catalyst by which you can turn depressed areas into a more economically viable area. And given my area of Watts that I am trying desperately to bring to its feet, how can such a

statement like that be made, and how can you perhaps define how this can be done in an area such as Watts?

Mr. SWINTON. Congresswoman Millender-McDonald, the SBA has set forth on several different initiatives to try to reach out to a lot of the rural and low-to-moderate-income areas. One of the initiatives that we do have in place right now, is one that you mentioned earlier, the one that we have with the historically black colleges and universities——

Ms. MILLENDER-MCDONALD. Yes.

Mr. SWINTON [continuing]. And small disadvantaged businesses. Through that initiative we have several agencies as co-sponsors with us on that. We have set out and trained over 75 historically black colleges and universities, and a little over 100 small disadvantaged businesses.

In those small disadvantaged businesses, we also included minority businesses as well as women-owned businesses. We have just recently provided four grants to minority institutions in several states to allow them to act as mentors in their states. And those particular institutions are located in rural or low-to-moderate-income areas. Those institutions are actually putting on seminars and conferences and inviting women-owned companies, minority-owned companies and small disadvantaged businesses.

Ms. MILLENDER-MCDONALD. Well, now, let me just ask you. Given the scenario that you have given to me, what type of technical assistance is given to those who you are entrusting to provide the type of service to the small businesses?

Mr. SWINTON. With those particular institutions, we have provided grants to the tune of $50,000 annually to provide the resources necessary to put on the conferences and the seminars. Those institutions also implemented what is known as a Phase Zero program for STTR and SBIR in their states. This is an annual competition using actual technology topic areas from one of the agency's solicitations prior to the actual opening of the solicitation.

The institutions allow the companies in those areas to submit proposals to the institution. The institution then will evaluate those proposals, and based upon the content and the technical merit of those proposals, select as many as four or five of those proposals and make awards up to $1,000 to the small businesses. This will help them further develop or put finishing touches on those proposals so that those same proposals can then be submitted to an actual federal agency.

We also have provided rural outreach grants to 25 states through the Rural Outreach Grant Program. These states have entities within them that have also set out to include small businesses in low- to moderate-income areas to participate or to get more participation in the SBIR and STTR Programs.

Ms. MILLENDER-MCDONALD. You know, Ms. Goodnight spoke of—at least of the four, I think, conferences, I did not note it, I was trying to internalize some of it, that granted one, at least one goes to a rural state.

Mr. SWINTON. Yes.

Ms. MILLENDER-MCDONALD. How in the world are we ever going to bring rural community, inter-cities or anything else up if we can only have one throughout all of the rural states that we have, and

certainly the urban states, one of which I represent? It is not an urban state that I represent but I represent an urban and suburban district.

Ms. GOODNIGHT. The reference to the rural state was in regard to the three National SBIR conferences being held each year. At least one of these is held in a rural state.

We also participated in a multi-state outreach tour called SWIFT SBIR: Where Innovation Focuses Technology. We kicked off in Minnesota and then went to Wisconsin, Iowa, Nebraska, South Dakota, and North Dakota.

Ms. MILLENDER-MCDONALD. Well, I hope SWIFT is an acronym and not swiftness going through without anyone really getting——

Ms. GOODNIGHT. No, it's an acronym.

Ms. MILLENDER-MCDONALD. Any skills necessary to sustain itself.

Ms. GOODNIGHT. About eight program managers from the federal agencies traveled by bus, moving to a new state each day to brief in those states. Our main goal is to try and visit as many states. We have been to Montana. We have been to Oklahoma. We will continue working within those states who are interested in hosting a conference.

Ms. MILLENDER-MCDONALD. What is the prerequisite for a conference to be held in either one state or the other given urban, suburban and whatever? Do you have a set of criteria for urban and a different one for suburban and rural?

Ms. GOODNIGHT. Not at all. In fact, the national conferences that have been held in rural states, have attracted hundreds of potential applicants.

I can tell you that the conference that NIH is hosting on July 2nd and 3rd right there on the Bethesda campus already has 1,008 registrants, and they truly span the entire United States, all the way out to Alaska.

Ms. MILLENDER-MCDONALD. And I see—you are putting the light on me, Mr. Chairman.

Mr. Polansky did mention that there needs to be an increase in funding for the programs. I have written that someplace here.

If there is an increase because of the drop-off that, there was such a drop in 1998 and 1999 you mentioned, and yet with the combining of STTR and SBIR the numbers went up again.

Is this the type of wedded situation that has to be done for this to reach a pinnacle of success?

Mr. POLANSKY. Well, the increase in funding that I mentioned was to raise the award limit on a Phase II STTR from $500,000 to $750,000.

Ms. MILLENDER-MCDONALD. And I can see the legitimacy to that, yes.

I think it was the second person whose name—yes, that you thought that the budget should be increased. Is that a recommendation you should be giving the President?

Mr. FOREMAN. No. I think somebody misheard me on that one.

Ms. MILLENDER-MCDONALD. Oh.

Mr. FOREMAN. I am sorry. The administration position is no, the funding is to remain at——

Ms. MILLENDER-MCDONALD. As it is.

Mr. FOREMAN [continuing]. The .15, as opposed to, I guess, the .3 that was proposed earlier, and this is basically connected to Secretary Rumsfeld's strategic review. Once we go through that, I am sure we will find out a little bit further along where we are.

I do not know that we have the data to support the trade-off, what are we going to get for the increased funding versus what are we going to lose for the flexibility to the program managers who work the various programs.

We do support the continuation of the STTR and we believe it has been a tremendous benefit to us.

Ms. MILLENDER-MCDONALD. So why not an increase?

Mr. FOREMAN. Well, again, I do not know that we have the data to support that it is going to give us——

Ms. MILLENDER-MCDONALD. So we would have to wait for data in order to support the increase, and of course I can understand that.

But if we are——

Mr. GRUCCI. With all due respect.

Ms. MILLENDER-MCDONALD. Mr. Chairman, I know you are and I am just going to say with——

Mr. GRUCCI. The gentlelady's time has expired.

Ms. MILLENDER-MCDONALD [continuing]. All of us trying to really move small businesses, there is such a critical need for us to increase funding and increase technological skills.

Thank you so much, Mr. Chairman.

Mr. GRUCCI. Thank you. I appreciate you yielding.

We will now hear from Ranking Member Udall.

Mr. UDALL. Thank you, Mr. Chairman.

I guess my first question is for Dr. Polansky. What specific outreach is Energy doing to reach small businesses in rural areas?

Mr. POLANSKY. We participate in the national conferences along with other federal agencies. In addition, we also participate in a few regional and some very localized conferences that are brought to our attention.

Mr. UDALL. Does Energy assist with funding on any specific outreach initiatives with the SBA?

Mr. POLANSKY. We do not.

Mr. UDALL. Does Energy work with our national laboratories to conduct outreach initiatives?

Mr. POLANSKY. Yes, we do. The degree of outreach depends on the mission of the laboratory, for example, whether it is a science laboratory or more of an engineering-oriented laboratory. In general, our laboratories have extensive outreach programs. For example the Sandia National Laboratory in Albuquerque, New Mexico has an active small business outreach program and has made numerous connections with small businesses.

Mr. UDALL. Do you think that might explain more the grants going to Albuquerque, those figures that I used earlier?

I have Los Alamos in my district. It is—I do not think it would be considered engineering. It is more science, and yet we have not had the kind of success, I guess, that Albuquerque area has had on these STTR grants.

Do you think—is it the management at the top of the institution? I mean, what would be your thoughts on that?

Mr. POLANSKY. I think there are several, several aspects that may contribute to that. One, frankly, could be the location of the laboratory in Los Alamos versus Albuquerque, and the types of small businesses that are located near the laboratory. The mission of the laboratory at Los Alamos has more of a science flavor to it than Sandia in Albuquerque, and so I think that is probably another factor as well.

Mr. UDALL. But it would seem, since this is—this program is suited to do this kind of transfer. If the department people and the laboratory people work together, you could move that forward, would you not think?

Mr. POLANSKY. Yes, I would think so.

Mr. UDALL. Yes. Thank you, Doctor, very much.

This question is for Mr. Swinton. How many STTR awards have been made to firms located in hub zones?

Mr. SWINTON. Unfortunately, Congressman Udall, I do not have that statistic with me today, but I will be more than happy to provide it to you at a later time.

Mr. UDALL. Yes. My state has a number of those hub zones and so I would be interested——

Mr. SWINTON. Okay.

Mr. UDALL [continuing]. In looking at that.

And I am going to yield back my time at this point, Mr. Chairman.

Mr. GRUCCI. Thank you, sir.

We will now go to Representative Bill Shuster from Pennsylvania.

Mr. SHUSTER. Thank you, Mr. Chairman.

First, thanks for all the witnesses coming today and spending your time with us, educating us, especially me being a relatively new, new member of Congress.

But first, I have a request. Is it possible to get a list in Pennsylvania, the institutions—educational institutions that you work with now and a list of the businesses that you were dealing with?

Mr. SWINTON. Yes. I can provide that data to you.

Mr. SHUSTER. Thank you.

And I think this program is an excellent program for small businesses. I did not hear any concrete evidence of the success, some I heard, but does the SBA, do you track that? Do we know how many products have been successfully taken to market over the term of the program?

Mr. SWINTON. We do have some statistics. There is a comprehensive study that has just been completed by the General Accounting Office that I understand is going to be released tomorrow that will have more data on it, but we do have some success stories and some numbers on the STTR Program.

Mr. SHUSTER. And also I would be interested, if you track new businesses, start-up businesses that you—do you track that?

Mr. SWINTON. Yes, we do.

Mr. SHUSTER. So you could tell us what new businesses or start-ups versus existing businesses that are——

Mr. SWINTON. We can probably provide you the data on the companies that are new to the SBIR and they would be new to the STTR Program, like first-time companies. We would have to do a

little more digging in order to determine whether or not that company is a start-up by delving more into the information provided by the small business. That information goes to the agencies, so the SBA would have to go back and check with the agencies to get additional information on that.

Mr. SHUSTER. Right. And you can tell us then, is it typical for a small company to keep coming back with new innovation?

Mr. SWINTON. Yes.

Mr. SHUSTER. New requests?

Mr. SWINTON. Yes. Yes, it is.

Mr. SHUSTER. I would like to be able to see that information. That would help me with this program.

Mr. SWINTON. Okay. Like the reoccurring companies in the program?

Mr. SHUSTER. Sure.

Mr. SWINTON. Fine.

Mr. SHUSTER. Another question I had is what—and I understand we have three different departments, actually four different departments here, and the SBA is sort of the clearinghouse, focal point for this program?

Mr. SWINTON. Yes.

Mr. SHUSTER. And I heard the Energy Department and NIH talk about their programs to get out into the communities. Does the SBA do anything similar to that where you are coming out into communities to education and inform of this program?

Mr. SWINTON. Yes, we do. We do a lot of outreach. We participate with most of the agencies, the STTR agencies, and the ten SBIR agencies, in all the national conferences, various regional conferences, as well as local conferences. The SBA also participates in numerous workshops and seminars that are put on by the 25 states that participate in the Rural Outreach Program as well.

I also mentioned in my opening statement the Federal and State Technology Partnership, or FAST, which is a new initiative that was just authorized through the recent SBIR reauthorization bill. FAST is a grant program which allows all 50 states and five U.S. territories an opportunity to receive grant funding through the SBA to provide outreach and training, business and technology development and proposal writing skills, to small innovative firms in their states and to build a technology infrastructure. We definitely plan to work with those states to assist them in implementing those infrastructures.

Mr. SHUSTER. Thank you.

And one of the, I guess the six—Mr. Camarota.

Mr. CAMAROTA. Camarota.

Mr. SHUSTER. Camarota. Sorry about that.

You had a couple of recommendations, and one of them or a couple of them centered, it seemed, to me on sharing of information. I take it now you are not—previous successes, you do not get to see that and how the strategy was to going to market with those products?

Mr. CAMAROTA. Not directly that, Congressman. Proprietary information is the life blood of a technology company. I'm sure my colleague would agree with that. One of the cultural conflicts that takes place between an ongoing for-profit enterprise and a research

institution is that the institution, specifically a college or university, the driving force from that culture is the old publish or perish. They want to tell the world what they are doing. We do not want anybody to know until we get a patent position on it.

So what happens sometimes is that their desire to just increase the basic knowledge in the state of a specific art really is detrimental to the commercialization process. There is a lot to be said for getting the information out into the general population, but it is a timing issue. It is a timing issue.

It is not so much the success stories that I was referring to about the program, but during this collaboration between the research partner and the small business that the trade secrets or the confidentiality or the insights that are brought to the table by the small business enterprise really needs to be respected by the research partners.

Mr. SHUSTER. So you are saying they are sharing too much. I misunderstood you. I thought at one point you made some reference to the SBA or one of these other organizations talking about marketing strategies, how something—when something was successful and went to the market, what the marketing plan was, sharing it with other people during this program.

Mr. CAMAROTA. Well, I think that there should be a sharing of strategies and how to utilize the program and how to streamline getting the product to market because obviously our perspective is to generate revenue for the business.

Mr. SHUSTER. And that is what we want to do here too, I guess, economic development, jobs and that is why it is a great program.

But I, again, appreciate all of you coming here today and I see my time has expired.

Mr. GRUCCI. Thank you, sir.

And now we will hear from the distinguished gentleman from Illinois, Mr. Phelps.

Mr. PHELPS. Thank you, Mr. Chairman, and those of you who came today to share with us, thank you very much. It is very helpful for us to be educated about what is going on in this regard.

Ms. Goodnight, the outreach conferences, I know that we have had some questions on it, but I am going to revisit that. Even though Illinois is thought of as an industrial state, and indeed we are, I live 400 miles south of Chicago, and there is a guy traveling through my hometown one time. The policeman pulled him over. He swerved to miss a cat in the road. And he asked him where he was from, and he said he was from Chicago. He said, what are you doing with Illinois license plates on? [Laughter.]

So sometimes there is a different world in Illinois, and I am it down on the border of Kentucky, Missouri, and Indiana, in that hub.

So when something of this regard could possibly come to rural downstate Illinois, it's very much a part of my district, I would get excited to see. So what kind of participation possibilities would there be to come into a state that is not normally quote "known as rural" because of our trademark, I guess, of bigger cities, but indeed we are. We have a lot of agriculture and farming, as well as just small business communities, one of which I used to be involved

in and my family. So how do you get a schedule, how does someone apply, an area, for such conferences?

Ms. GOODNIGHT. Interesting you should ask because June 6 five of the agencies participated in a conference in Chicago. It drew 600 plus participants from all over Illinois and surrounding states. I am sure we could provide you a list of the participants if that is of interest to you. The Illinois Technology Assistance Conference was the first conference of its kind in Illinois. Deb Webb, Director, Small Business Technology Coalition, was the organizer of it. And we are looking forward to working with her on future conferences.

It has not really been stated yet, but I will take the opportunity. None of the SBIR or STTR funds may be used for any administrative purposes whatsoever, including outreach. So we have a very full schedule. Many of us, including myself, spend at least 50 percent of our time going to state conferences, regional conferences, national conferences, or hosting our own. We try to encourage regional conferences because they attract participants from a number of states. They encourage potential collaborations. And, they maximizes the use of an agency's time.

We work with state entities who have an interest in promoting the Programs and raising awareness about the funding opportunities. We work with them and their calendars to plan conferences that don't overlap.

So I anticipate we will be back in Illinois but we might not actually be in Chicago again. I would be happy to talk with others in the southern part of the State to find out how we can be of more assistance.

Mr. PHELPS. Just for your information, Southern Illinois University, I am a graduate of there, and it is sort of the hub of tri-state, Paducah, Kentucky, Cape Girardeau, Missouri, Evansville, Indiana, so you have a good regional outreach there. And still, say that you were located—that you schedule within a rural setting itself. You know, I mean, rural people you say it is going to be something about rural in Chicago, that would scare them to death probably.

Ms. GOODNIGHT. Right.

Mr. PHELPS. Not necessarily always, but I hear what you are saying. We appreciate you even coming to Illinois. But if we could, I would stress it would be a great help to come down the state.

Dr. Polansky, a question. In your statement you had mentioned over the seven years that the department received 1,377 Phase I applications, and that you awarded 117, and then 39 actually made it through Phase II.

Do you count that as successful percentage in regards to—I mean, the numbers don't really stand out to me, but maybe there is more behind it than I realize.

Mr. POLANSKY. In terms of the total number of grant applications that we receive compared to the number of STTR awards made, that's about the percentage that we see in the SBIR program. Also, the percentage of STTR Phase I grants that go into Phase II, that is on the order of what we are seeing in SBIR as well. So nothing is out of the ordinary if you compare our STTR experience with SBIR.

Mr. PHELPS. But I guess what I am saying from both programs why would there not be a larger success rate? Is it due to the funding?

Mr. POLANSKY. There are several factors why only roughly one in ten proposals are funded.

First, one is they just do not meet the criteria. Another contributing factor is that they are not responsive to the topic in the solicitation or do not meet some other provision of the SBIR or STTR solicitations.

Mr. PHELPS. Sorry. I guess I am out of time, but the criterion is not clear and explained to people? I mean, why are they not—why do they know that they failed, didn't meet the criterion going in?

Mr. POLANSKY. One of the criterion we use is what is the intrinsic scientific and technical merit of the proposed approach. It is not unlike a research proposal in that regard, and that is where a reasonable number of STTR proposals fall short.

Mr. PHELPS. Thanks.

Mr. POLANSKY. You are welcome.

Mr. GRUCCI. Thank you.

I just have a couple of questions myself, and then we will let you get back about your business, and this, I guess, is for the entire panel. You can feel free to answer.

When the STTR Program was created, we all recognized the value that it had and we were expecting to exploit vast reservoirs of commercially—commercially promising ideas, et cetera. Do you feel that this program has been a success? And whoever feels more comfortable in starting out the answer can certainly take a stab at it. Anyone.

Mr. CAMAROTA. It's been a——

Mr. GRUCCI. If nobody wants to answer, it must be a failure.

Mr. CAMAROTA. No, certainly it has been a success or you would not have all these different companies clambering for the funding. I think success is—it is on a continuum. It is not like a point of departure. Success determined as companies perform successful research or do they actually get a product to marketplace?

Mr. GRUCCI. I guess my question goes to more is it successful in helping people get started, getting the opportunity.

Mr. CAMAROTA. Most definitely.

Mr. CARROLL. Yes, I would concur with that, and I think measured against other R&D, I think, the commercialization success of both the SBIR and the STTR program stands way ahead, and I think the GAO has confirmed that on a number of audits.

I do not know about the STTR Program as much as SBIR Program, but since they are so similar by extension, I would say STTR would be just as successful.

There has never had a bad GAO audit, and that is pretty unusual for a program.

Mr. GRUCCI. Thank you.

Mr. Swinton, are there any areas of the STTR Programs that you think need to be improved and what can Congress or the administration or collectively what can we do to help in that endeavor?

Mr. SWINTON. The only area in the STTR Program that the Administration supports an improvement is in the increase of the

Phase II level of funding from the $500,000 level that it is at now to $750,000.

Mr. GRUCCI. And the rest of the program, in your estimation, is fine? It does not need any help?

Mr. SWINTON. At this particular time we feel comfortable with the program as it is.

Mr. GRUCCI. Great.

Dr. Polansky, in my district, Brookhaven National Laboratory is currently participating in the program, but not in a—but in a very limited way and in a very limited role. And in speaking with representatives there, they would like to and would be very interested in trying to expand their participation in this.

What is the Department of Energy doing, since it is your responsibility to find interested firms, what programs does the DOE have in place to recruit small businesses and how can we continue to make this program expand and get better?

Mr. POLANSKY. We certainly work with the management of the laboratory at Brookhaven to make everyone aware of the STTR Program, and to encourage the laboratory to engage the small business community.

In addition, in that part of the State of New York, there is an excellent research capability within the State University of New York at Stoneybrook which is in partnership with——

Mr. GRUCCI. Yes, they partner with the Brookhaven National Lab.

Mr. POLANSKY. Yes. I think this is a potentially powerful combination for small businesses who are interested in the fields of research that both of those institutions pursue.

Mr. GRUCCI. And we would hope that you would encourage more of those small businesses to use that facility.

I wanted to thank all of you for being here today. I think your testimony has been very enlightening, and I appreciate everything that anybody had to say. If there are no further questions, Mr. Shuster, do you have anything else that you would like to ask?

Mr. SHUSTER. No.

Mr. GRUCCI. At this time this hearing is adjourned.

[Whereupon at 4:12 p.m., the hearing was adjourned.]

APPENDIX

STATEMENT OF HON. JOHN R. THUNE

Good afternoon. It is a pleasure to welcome all our witnesses to this joint hearing between the Subcommittee on Rural Enterprises, Agriculture and Technology and the Subcommittee on Workforce, Empowerment and Government Programs.

Today's hearing has been called to discuss the Small Business Technology Transfer Program, which is up for reauthorization this year. The Technology Transfer Program, commonly known as STTR, was created in 1992 for the purpose of utilizing the vast reservoir of commercially promising ideas at our nation's research institutions.

Authorization for this important small business program expires in September, and it is the committee's intent to work with the Senate Small Business Committee to reauthorize this important program by September 30th of this year.

STTR is a competitive federal grant program that reserves a specific percentage of research and development dollars for small businesses and their nonprofit research institution partners.

Key to the success of STTR is that it requires a cooperative venture between a for-profit small business and a researcher from a university, federal laboratory or a nonprofit research institution for the purpose of developing commercially viable products from ideas spawned in a laboratory environment.

While the Small Business Administration is the coordinating agency for STTR, five federal departments and agencies actually implement STTR and designate research and development projects and accept proposals from the private sector.

These agencies—Department of Defense, Department of Energy, Department of Health and Human Services, National Science Foundation, and the National Aeronautics and Space Administration—reserve a portion of their R&D funds to award contracts to STTR partnerships.

This program has enjoyed a wide degree of success, and the small business and research communities are very supportive of its continuation. STTR has helped create new jobs and stimulate our economy by bringing new technologies to the marketplace and helping new business ventures develop into stable small businesses.

As a Representative from a rural state, I can tell you that job creation is vital to the small communities in South Dakota. The establishment of just one new small business makes a huge difference on Main Street, USA. A small business with 100 employees in a town adds: 351 more people; 79 more school children; 97 more families; $490,000 more in bank deposits; $565,000 more in retail sales per year and over $1 million more in personal income per year.

I want to again thank the witnesses for appearing before the two subcommittees today, and we look forward to your testimony.

STATEMENT OF REPRESENTATIVE MILLENDER-MCDONALD

Good afternoon, Mr. Chairman. I am pleased to participate in this timely hearing on the Small Technology Transfer Program (STTR). Technology and its associated applications is the engine that is driving our economy. But it is important to remember that small businesses have fueled the recent economic expansion and they serve as the conduit to deliver goods and services in the 21st Century.

Virtually nothing we do on a daily basis remains unaffected by technological growth and or research and development. In our homes we use programmable microwaves in addition to advanced technology related to personal medical devices. Our cars have global positioning systems, and our portable phones allow us to access the Internet. Indeed, we have entered into a new and exciting frontier.

This new frontier must be navigated and that is our purpose today; to examine how the STTR program administered by the SBA is enabling and supporting the interests of our economy and small businesses. The STTR was designed to address

the lack of capital that small business research firms experience. It achieves this objective by partnering small firms with private research institutions, federally funded R&D centers, or non-profit organizations. I am particularly interested in determining what can be done to enhance partnerships between private research institutions and minority and female-owned small businesses.

As the September 30th deadline for reauthorization approaches for STTR, I am concerned about whether this program is doing enough to meet the needs of the small business research and development sector. I am very curious about why of the 864 STTR awards from FY 1994–FY 1998, only 13 or 1.5 percent were to women-owned businesses, and why only 2.8 percent went to minority-owned companies? While I acknowledge the strides that have been made regarding partnerships between Historically Black Colleges and Universities (HBCU's), Minority Institutions (MI's) and the SBA, so much more needs to be done.

Therefore, I am very interested in determining what has to happen in order to assist small businesses to gain access to opportunities that much larger businesses enjoy. I also want to explore why inner cities and rural communities are being left behind in the technology partnerships that are occurring.

I look forward to receiving answers to these questions and many others. Thank you.

STATEMENT OF MAURICE SWINTON

Chairman and distinguished members of the subcommittees, thank you for inviting me here today. I am pleased to discuss the Small Business Technology Transfer (STTR) Program. I am Maurice Swinton, the Assistant Administrator for the Office of Technology, with responsibility for managing the STTR Program, the Small Business Innovation Research (SBIR) program and the newly authorized Federal and State Technology Partnership Program.

In 1992, the Congress enacted Public Law 102–564, which authorized the STTR program as a companion program to the SBIR program. Despite the success of the SBIR Program, Congress felt that more could be done to link small businesses with creative ideas at universities, non-profit scientific and educational institutions, and Federal laboratories. This collaboration would result in a better commercialization rate for Federally sponsored research conducted at non-profit institutions. Both programs (SBIR and STTR) share the same underlying philosophy—use Federally funded research and development requirements to promote technological innovation by small businesses and strengthen the American economy.

The STTR program is structured in three phases similar to SBIR with a few minor differences. Phase I in the STTR program is to evaluate the scientific, technical and commercial merit of an idea, funded at $100,000 and is generally for a one year period, as opposed to $100,000 and six months in the SBIR program. Phase II in the STTR program funds phase I projects that have the most potential for further development. Phase II award funding is $500,000 and the project duration period for 2 years instead of $750,000 for phase II and same project duration period in the SBIR program. Under Phase III, no Federal STTR funding is provided. Private sector support is used to bring the innovation to the commercial marketplace.

The 10 participating agencies in the SBIR program have research and development budgets greater than $100 million, and are required to reserve 2.5% for their SBIR programs. Conversely, the 5 agencies participating in the STTR program have research and development budgets greater than $1 billion, and must reserve .15% for their STTR programs.

Unlike the SBIR program, the STTR program involves cooperative research and development performed jointly by a small business and a research institution. Research institutions eligible to partner with a small business in the STTR program include universities and colleges, non-profit research centers, or federally funded research and development centers (FFRDC's). Although the conduct of the project is a cooperative research and development venture, the small business exercises overall management, control, and responsibility for the project.

Participating agencies must ensure that the small business manages and controls the funding agreement pursuant to a business plan that provides for the commercialization of the technology being funded. The small businesses must negotiate a written agreement with the research institution covering allocation of intellectual property rights and, if any, rights to carry out follow-on-research, development, and commercialization. To facilitate this process, participating Federal agencies and SBA make sample model agreements available to the small business.

In establishing STTR, Congress intended to create a vehicle for moving ideas from research institutions to the market, where they can benefit the U.S. economy and,

at the same time, serve the mission need of the sponsoring federal agency. In its eighth year of operation, the STTR program continues to meet these objectives and has had an impact on innovation and commercialization of products and services. In FY 1999, participating agencies issued 329 awards to small technology firms totaling over $64 million. For the past 4 years, the STTR program has provided an average of $65 million annually for small businesses and their research partners to accomplish the research and development needs of the participating agencies. Since the inception of the program, over $198 million has been awarded to 1,157 small businesses. These firms provide jobs and economic growth in most states.

Since the inception of the STTR program, just over 250 universities across the United States have partnered with small innovative firms to conduct research for a STTR funded project. The SBA now makes this information available to the public through the agency's Technology Resources Network database (TechNet). Small businesses can search for research partners that possess unique technical capabilities to team with to submit a proposal to the STTR funding agencies. The SBA plays an important role as the coordinating agency for the STTR program. We help the five agencies implement the program, review their progress, and report annually to Congress on program activities.

SBA is also the information link to research topics being proposed by the Federal agencies. We collect solicitation information from the agencies and publish quarterly updates in a Pre-Solicitation announcement. The topics and anticipated release and closing dates for this information can be accessed from the SBA's website.

SBA also has been very successful in working with the states through the Rural Outreach Program. This program provided 25 states an opportunity to receive grant funding to support statewide efforts to increase their participation levels in the programs. These states met the criteria established in Public Law 105–135, as states that received less than $5 million in funding during fiscal year 1995. They also showed a low participation rate in the SBIR and STTR programs. A list of the 25 states is attached.

SBA has also been very successful through its initiative to increase the participation levels of small disadvantaged businesses and minority educational institutions in the programs. The SBA, along with our Federal cosponsors—Defense Advanced Research Projects Agency, and the Environmental Protection Agency—has provided a series of SBIR and STTR seminars and workshops for small disadvantaged businesses and minority institutions. To date, four seminars have been conducted with the participation of 30 minority universities and 75 small disadvantaged businesses. The initiative has provided grants to four minority institutions to serve as mentors in their respective states to encourage small disadvantaged businesses to participate in the programs, using preliminary competitions in which the research topics are taken from actual Federal agency STTR and SBIR solicitations. The firms prepare proposals, and submit them to the minority institution for evaluation. Firms can then receive awards up to $1,000 for the submission of a successful proposal. After the firm has completed the critique recommended by the minority institution, the proposal is submitted to the Federal agency issuing the topic. We began this process in August 2000, and to date 12 proposals have been submitted to the SBIR and STTR programs, and five have been funded by one of the participating Federal agencies. As you can see in one year, we have achieved a 40% success rate in proposal submissions through this initiative. We anticipate a higher success rate in the coming years.

Assessments of the program have been favorable. For example, the 1996 review by the United States General Accounting Office (GAO) made the following statement: "technical evaluations of STTR proposals showed favorable views of the quality of the proposed research and commercial potential. For research quality, the evaluations (1) awarded perfect scores to many proposals, (2) rated proposals among the top 10 percent of research in certain agencies, (3) described some proposals as "cutting edge", and (4) generally found the quality to be excellent for commercial potential, the evaluations arrived at similarly favorable conclusions."

Quantitative measures of program success are essential, but they often don't tell the whole story. A closer look at specific STTR cases shows us that the returns on our public investment in the STTR partnerships are multifaceted. For example, under the Air Force STTR program, Magnetic Imaging Technologies Inc. of Durham, North Carolina has developed a Magnetic Resonance Imaging (MRI) technology, originated by a Princeton University physics professor, that creates images based on gas, rather than liquid (as under the existing MRI technology). Thus, for the first time, this technology enables clear imaging of the ventilation in a patient's lungs—a major breakthrough in the diagnosis of lung diseases and disorders, including, for DoD, chemical weapons' exposure of soldiers during battle. The company initially attracted over $1 million in outside investment to match DoD's funding of $600,000,

including a cash investment form the individual who headed General Electric's development of the initial MRI technology 20 years ago. The company has since attracted more than $15 million in additional private investment, and was recently acquired by Nycomed Amersham, Inc., a world leader in diagnostic imaging The technology is now undergoing clinical trials. If successful, data from these trials will be used to support an application to the Food and Drug Administration for marketing approval. The market size exceeds $100 million.

Authority for the STTR program expires on September 30th of this year. The Administration supports reauthorization of the program for a three-year duration, and no increase to the percentage set aside for the program. The Administration would also support an increase in the phase II awarded level to $750,000.

Thank you for the opportunity to appear before you today. I will be happy to answer any questions you may have.

ELIGIBLE STATES FOR THE RURAL OUTREACH PROGRAM

(1) Alaska, (2) Arkansas, (3) Delaware, (4) District of Columbia, (5) Hawaii, (6) Idaho, (7) Indiana, (8) Iowa, (9) Kentucky, (10) Louisiana, (11) Maine, (12) Mississippi, (13) Missouri, (14) Montana, (15) Nebraska, (16) Nevada, (17) North Dakota, (18) Oklahoma, (19) Puerto Rico, (20) Rhode Island, (21) South Carolina, (22) South Dakota, (23) Vermont, (24) West Virginia, (25) Wyoming.

TESTIMONY OF THE DIRECTOR, OFFICE OF SMALL AND DISADVANTAGED BUSINESS UTILIZATION, OFFICE OF THE UNDER SECRETARY OF DEFENSE FOR ACQUISITION, TECHNOLOGY & LOGISTICS

Mr. CHAIRMAN and MEMBERS OF THE COMMITTEE: Thank you for the opportunity to appear before you today, as the Department of Defense (DOD) representative, to discuss the Department's Small Business Technology Transfer (STTR) program, the STTR program, first authorized to expend funds in 1994 as a pilot program, funds mission-oriented cooperative R&D projects between a small technology company and a research institution (i.e., university, federally-funded R&D center, or nonprofit research institution). It thus attempts to join together two powerful forces for technological progress: the entrepreneurial talents of small technology companies and the innovative ideas of the R&D scientists and engineers in U.S. research institutions. These STTR partnerships may be a unique and effective vehicle for moving ideas from research institutions to the market, where they can improve the performance and affordability of our defense systems as well as benefit the U.S. economy.

U.S. research institutions represent a vast, and often untapped, technology resource, thus the potential benefit of involving them in our R&D is enormous. Our nation's research institutions employ a significant number of scientists and engineers in the United States, and perform billions of dollars in R&D each year. Their efforts have contributed significantly to our nation's leadership in basic research and many areas of applied research. They have also generated the research breakthroughs that made the United States a military superpower in the post-world war II era.

The scientists and engineers in these institutions often recognize that their research has important commercial or military applications, but have few efficient mechanisms to pursue these applications. Regular research grants generally fund more basic research; furthermore, these researchers can only participate in the larger SBIR program in a consulting or minor subcontracting role as long as they remain primarily employed at the research institution. Consequently, many potential commercial and military applications languish in the research laboratory.

Although STTR involves the significant participation of research institutions, it is still very much a small business program. It is also a highly promising program, serving as a unique and effective vehicle for harnessing ideas and expertise in our nation's research institutions for the benefit of the U.S. military and the U.S. economy.

There are many examples of successful STTR projects that offer promising benefits for our military capabilities and improvements to the economy through commercialization of technology developed under the STTR program.

Since 1997, when current STTR funding levels became effective, the DOD STTR program funding has remained relatively stable with FY 2001 funding experiencing a slight increase. However, the number of proposals submitted in response to our identified R&D needs decreased significantly starting in FY 2000 and continuing in FY 2001. We are not sure why the number of proposals submitted under the STTR program is declining but have identified the situation as a matter for examination.

Contingent upon Secretary Rumsfeld's strategic review, the Department supports reauthorization of the STTR program at current funding levels (0.15 percent of our extramural R&D budget). Likewise, contingent upon the strategic review, the DOD does not see that an increase in the percentage of extramural R&D budget from .15 to .30 percent is necessary because proposed legislation (S856) and data on the STTR program do not show that such an increase will provide the Department commensurate additional value in meeting its mission.

Thank you for the opportunity to appear here today. I will be happy to answer your questions.

STATEMENT OF JO ANNE GOODNIGHT

Good afternoon, I am Jo Anne Goodnight, Coordinator of the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs at the National Institutes of Health (NIH). Our mission is the conduct of biomedical and behavioral research to improve the health of the nation. On behalf of NIH, I am pleased to have the opportunity to testify before you today on the reauthorization of the Small Business Research and Development Enhancement Act of 1992, which was reauthorized by the Small Business Reauthorization Act of 1997.

This act is the enabling legislation for the STTR Program. The STTR and SBIR Programs are important components of the NIH extramural research portfolio. Within the Department of Health and Human Services (DHHS), the NIH constitutes about 98 percent of the Department's entire SBIR program and 100 percent of the HHS STTR Program. In addition, the NIH budget now constitutes the second largest amount of SBIR and STTR funding available across the Federal government. In FY 2000, the NIH awarded 1,629 SBIR awards (including R&D contracts) amounting to $353 4 million and 138 STTR awards amounting to $21.8 million. In FY2001, we expect to award 1,800 SBIR awards and 145 STTR awards for a total of more than $435 million.

Technologies funded through our SBIR and STTR Programs have resulted in significant improvements to the health of the nation's people. The NIH STTR Program serves as an important complement to the SBIR Program by providing an effective mechanism for supporting commercially viable innovations that originate in our nation's research institutions.

As you know, the SBIR and STTR Programs share a number of common features. Each is structured as a three-phase process; each focuses on stimulating and fostering scientific and technological innovations; and each provides an effective means for commercializing innovations derived from Federally-sponsored research. The Programs, however, differ in two very important aspects. First, to be eligible for an STTR award, a small business must establish a formal collaborative relationship with a non-profit research institution; under the SBIR program this is not required. Second, under the SBIR Program, the Principal Investigator (PI) must have his/her primary employment with the small business concern; under the STTR Program, there is no such requirement.

In this testimony, my comments will focus on some examples of the effectiveness of the NIH's STTR Program and ways in which the NIH uses the STTR Program to help us meet our mission. I also will describe some of our recent efforts toward streamlining and enhancing the Programs to better serve the needs of the small business community. Because of the similarities between the STTR and SBIR Programs, my comments are not solely limited to the STTR Program.

EFFECTIVENESS OF THE NIH STTR PROGRAM

Like the NIH SBIR Program, the STTR Program is well-integrated within the overall scientific programs and goals of the NIH. It has enhanced collaborative efforts between the small business research community and the academic research community. Though a much younger program than the SBIR Program, projects that have received NIH STTR funding are resulting in the development of products, processes and services that are improving human health through better detection, diagnosis, treatment and prevention of diseases and disabilities. These outcomes have also resulted in speeding the process of discovery, increasing productivity of other researchers, and decreasing the cost of some areas of research.

We are pleased that results of previous studies conducted by the General Accounting Office and the Small Business Administration indicate that the NIH SBIR program has one of the highest rates of commercialization of all agency SBIR Programs. Other program goals are being met as well, including using SBIR to meet federal research and development (R&D), and fostering participation by women, minority and disadvantaged persons in technological innovation. Even those projects

that have not realized the goal of commercialization have generated information for the equally important purpose of contributing to the knowledge base of science through peer-reviewed publications.

The success of our STTR and SBIR Programs may be attributed to several factors, the most significant of which is flexibility in our administration of the Programs. What have made our Programs so appealing are the opportunities for firms to propose R&D initiatives with truly revolutionary outcomes rather than restrict their ideas to projects that can only be conducted under a prescribed amount of time and money. Our experience is that the conduct of certain types of biomedical and behavioral research, such as nanotechnology, clinically-related studies, vaccine development, and drug discovery, does not routinely lend itself to prescribed maximum time and dollar levels. These are exceptions, but such projects can be important steps in integrally involving small business in some of the most exciting, cutting-edge research.

A second example of administrative flexibility is that while we issue grant solicitations for projects on specific topics, we also encourage investigator-initiated, mission-related and commercially-viable research projects by small businesses. In addition, because of the similarities between the two grant solicitations, both in research topics and in application instructions, NIH now issues a single solicitation for SBIR and STTR applications for multiple receipt dates throughout the fiscal year. The advantages of multiple receipt dates are numerous. If an applicant misses a deadline, the researcher need wait only four months, not a year, for the next submission date of a Phase I (feasibility study) or Phase II (full R&D) application. Applicants may also submit up to two revised applications on any of the receipt dates. Also, a small business with multiple core technologies can use the multiple receipt dates to stagger submissions of applications rather than dedicating all of its resources to just a single project.

A third example of administrative flexibility relates to the formal collaborative activities that must be conducted under the STTR Program. These collaborations may be initiated either by researchers at the small business concern or the research institution thereby creating a fertile ground for scientists and engineers to capitalize on the innovations and intellectual talents of their organizations. Collaborative opportunities such as these are most likely to result in innovative projects that have the greatest commercial potential and societal benefit.

STTR SUCCESS STORIES

NIH has numerous exemplary STTR projects that have achieved success and have resulted in significant improvements to our nation's health. I would like to discuss three in particular, two of which have partnered with the University of Alabama at Birmingham (UAB.)

Through STTR support, Vaxin, Incorporated (formerly Vaxin Pharmaceuticals, Incorporated) of Birmingham, Alabama developed a needle-less vaccine technology. Vaxin researchers discovered that certain recombinant viral vectors could be applied to the surface of the skin, resulting in an immune response to the genetic insert. Funding provided by an STTR Phase I grant funding resulted in the development of a novel tetanus vaccine. NIH has awarded a Phase II STTR grant to complete the pre-clinical development of a vaccine patch and begin the testing of the vaccine in people. Vaxin is currently developing similar vaccines against a wide variety of infections or cancers, all targeted toward painless, needle-less administration using a patch that can be simply placed on the skin.

Another STTR success story is the development of unique molecular approaches using cell-based assays (TransAssay™) and gene transfer vectors (TranzVector™), by Tranzyme, Incorporated, also of Birmingham, Alabama. These platform technologies are being applied to a diverse array of commercial applications, including cell-based assays for drug discovery and target screening, tools for functional genomics, and in vivo gene therapy for the treatment of cancer, ocular diseases, blood-related diseases, and Central Nervous System disorders.

A third example of a successful technology developed through NIH STTR funding is the development of a thermal cycler machine, called the LightCycler, which was developed by Idaho Technology (IT). The LightCycler, which is tied to a process called polymerase chain reaction, can multiply and analyze strands of DNA and RNA 10 times faster than the equipment most research labs are using. In 1995, IT was a six-person niche player in the biotech business. Today IT employs 65 scientists and engineers and sells a growing range of instruments and reagents. IT company president states, "The STTR program gets much of the credit for this growth. Without the initial Phase I grant, we would not have developed the product that has brought us commercial success. The STTR program benefited us primarily

by providing the following: (1) Seed capital to prove principal on a high-risk project; (2) A structure for collaboration with the University of Utah; and (3) A requirement for formal project planning and a division of labor between IT and the University."

Mr. Chairman and Committee members. having provided an overview of how NIH has utilized the STTR Program and benefited from it, I would now like to address two important areas related to these Programs.

Importance of the STTR and SBIR Programs Given Their Similarities

Although the Programs share some common threads, NIH believes that the STTR serves a very important function and one different than the SBIR Program. While SBIR is a vehicle for harnessing innovative ideas in the private sector. STTR taps a pool of technological innovations in our nation's research institutions. STTR stimulates technology transfer by providing an effective mechanism for academicians to partner with a small company to pursue a commercially-promising idea that would otherwise languish on the shelf. Regular research grants typically fund basic research. While academic researchers may play a consultant or collaborative role in an SBIR project, these entrepreneurial scientists/engineers cannot participate in the SBIR program in a significant way as long as their primary employment is with the research institution. Therefore, STTR makes a significant difference to a university professor who desires to be an entrepreneur but cannot leave the research institution to start a small business.

Recently, we have noted that the dynamics of the STTR and SBIR Programs are changing. Research institutions are working toward establishing an entrepreneurial environment to allow academicians to pursue commercial applications of their innovative technologies. Such efforts to blend two distinct cultures have resulted in the development of mutually beneficial and synergistic relationships whereby the research institution retains the intellectual talent and the researcher is permitted to pursue and capitalize on their entrepreneurial activities. A few examples of research institutions that have successfully created an entrepreneurial environment include Purdue University, the University of Wisconsin at Madison, the Ohio State University, and the University of Alabama at Birmingham.

NIH Efforts to Enhance and Streamline SBIR/STTR Programs

STTR is a promising program, and NIH supports its continuation. While NIH has been leased with the success of both the STTR and SBIR Programs, we are taking steps to enhance and streamline the programs, particularly with regard to Phase I/Phase II gap funding, program data collection, and outreach.

In an effort to narrow the funding gap that typically occurs between Phase I and Phase II, NIH established a Phase I/Phase II Fast-Track option designed to expedite the decision and award of Phase II funding. Applicants who satisfy certain criteria that enhance the probability of the project's commercial success may submit Phase I/Phase II applicants for concurrent review. Small business concerns are encouraged to obtain commitments of funds and or resources from third party investors for commercialization of the project, process or service resulting from the STTR/SBIR grant. To date (since FY 1997) the NIH has issued 120 Fast-Track awards totaling $15.2 million. We realize that the Fast-Track option is not appropriate for all types of research. NIH informs "non-Fast-Track awardees" of other ways to bridge the funding gap. These include extension in time without funds, extension in time with funds, and allowing Phase II applicants to submit on any of our three annual receipt dates. In addition, we encourage awardees to seek potential State matching resources.

A second area NIH is focusing on to improve the STTR and SBIR Programs is through the establishment of a project monitoring system to collect and maintain information about our awardees. Such a data tracking system will enable NIH administrators to better determine the outputs and outcomes from projects supported through the SBIR and STTR mechanisms. Clearly, commercialization is a major goal of the STTR and SBIR Programs. However, for NIH awardees, there is often a lengthy time of seven to ten or even 12 years before Phase III commercialization is realized, a period that routinely extends well beyond NIH support. Thus, commercialization may be one metric for judging program success, but other measures will be considered as indicators of success, such as published papers, patents, FDA testing/approvals of drugs and devices, and the use of the technology in other research projects.

A third area in which NIH has focused to enhance the STTR and SBIR programs is through our outreach efforts. Each year, NIH participates in three National SBIR/STTR Conferences, at least one of which is held in a rural state or a state that has not received a large share of SBIR/STTR funding. On July 2 and 3, NIH will host its 3rd annual SBIR/STTR Conference at which over 900 attendees are expected. In addition, NIH staff routinely participate in regional conferences to provide informa-

tion about the NIH application, review and award processes and potential funding opportunities. Due to the heightened interest of research institutions to learn more about the STTR and SBIR Programs, we have incorporated sessions focused on STTR and SBIR funding opportunities. We will continue our efforts to raise awareness in States and research institutions within them to disseminate information related to the STTR and SBIR Programs. Broad dissemination of information about the SBIR and STTR Programs is also being accomplished through an NIH ListServe message system, encompassing over 8,000 subscribers from the small business community, academia, State entities, and others. NIH established a separate ListServe of STTR and SBIR awardees to inform them of important grant-related policies and procedures.

In recent years, several agencies participated in a SWIFT (SBIR—Where Innovation Focuses Technology) Outreach Tour in which the Federal Program mangers traveled by bus moving to a new State each day to inform small businesses and research institutions of STTR and SBIR funding opportunities. Last year, the SWIFT I "Field of Dreams" tour focused on the Midwest states. We visited Minnesota, Wisconsin, Iowa, Nebraska, South Dakota, and North Dakota. More recently, in May 2001, the SWIFT II "Patriot" Tour focused on northeast states, including Massachusetts, New Hampshire, New York, Connecticut, Vermont, and Maine. SWIFT III, targeted for May 2002, is expected to cover a number of states in the southern part of our country.

CONCLUSION

In conclusion, NIH is very pleased with its involvement in the STTR and SBIR Programs. I would be happy to answer any questions that you may have regarding our participation in these programs.

BIOGRAPHY—JO ANNE GOODNIGHT

Ms. Goodnight has 16 years of government service in which she currently holds the position as Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Program Coordinator of the Public Health Service and the National Institutes of Health (NIH). For nearly five years (1994 until March 1999), she served in the Division of Cancer Biology (DCB), National Cancer Institute (NCI), NIH, as a Program Director for SBIR/STTR grants that supported studies in the field of cancer biology, cancer genetics, and cancer immunology. She also held the position of Special Assistant for the Director, DCB, NCI, NIH. In 1997, she was appointed the SBIR/STTR Program Policy Coordinator for the NCI. Ms. Goodnight's research background is in cancer genetics and cancer immunology. From 1989 until 1994, she worked as an intramural research scientist in the Laboratory of Genetics, Division of Basic Sciences (formerly the Division of Cancer Biology, Diagnosis, and Centers), NCI, She has published over 20 studies about the selective involvement of Protein Kinase C in differentiation and neoplastic transformation. She received a Bachelor of Science degree in Microbiology from Virginia Tech in 1983.

STATEMENT OF DR. WALTER M. POLANSKY

Mr. Chairman and Members of the Subcommittees: I appreciate the opportunity to come before this committee to discuss the Department of Energy's (DOE) Small Business Technology Transfer (STTR) Program. During the past seven years, I have been responsible for the management oversight of the Department's STTR program.

Since the program's inception in 1994 and through Fiscal Year (FY) 2000, DOE issued seven annual solicitations for STTR grant applications. Over those seven years, the Department received 1,377 Phase I grant applications. DOE awarded 117 Phase I grants and 39 Phase II grants. The total dollar value of these awards was $30.6 million. The Department made Phase I awards to 101 small businesses, which is a much smaller percentage of multiple award winners than exists in the DOE Small business Innovative Research (SBIR) program. Each research project included a collaboration with a non-profit research institution. The breakdown among the research institutions is: DOE National Laboratories, 53; Universities 56; Other Non-Profits: 8. Although in the early years of the program the national Laboratories represented the majority of research institutions, this trend has reversed. Universities now collaborate on more DOE STTR projects than the National Laboratories. The Department's STTR budget is $5.3 million in FY 2001, represented 0.15 percent of the Department's extramural R&D budget (Public Law 102–564 and 15 U.S.C. 638 exempts amounts appropriated for the Department's atomic energy defense pro-

grams solely for weapons activities or for naval defense programs from participating in STTR.).

The Department of Energy's STTR program has produced a number of important benefits: (1) it has increased the participation of small businesses as performers of research and development of interest to the Department; (2) it has stimulated technological innovation; (3) it has fostered collaboration between the small business research community and research institutions, such as the Department's National Laboratories; and (4) it has contributed to the commercialization of Federally sponsored research and development.

Unlike the SBIR program, we do not have a wealth of data to provide a statistical assessment of the STTR's success. First of all, there are far fewer STTR Phase II awards. Also, because the STTR program is young compared with SBIR, small businesses participating in STTR have not had nearly as much time to commercialize their technology. Nonetheless, DOE has anecdotal information that illustrates our successes to date. For example,

"Laser Processing of Thermal Sprayed Beryllium Plasma Facing Components," a Phase II project conducted by Plasma Processes, Inc. in collaboration with Lawrence Livermore National Laboratory reported over $1 million in sales of plasma facing components (used in fusion energy research) and vacuum plasma coatings.

Hy-Tech Research Corporation obtained a follow-on contract with Caterpillar related to thin film deposition and diagnostics. This resulted from its 1999 Phase Ii STTR project with Lawrence Berkeley National Laboratory, "Boron Carbide Coatings for Enhanced Performance of Radio-Frequency Antennas in Magnetic Fusion Devices."

Jorway Corporation, in collaboration with Yale University, developed a new standard for high-speed data transfer, used in High Energy Physics research. This result was derived from its 1995 Phase II project entitled, "An Extension of the CAMAC Standard for Increased Data Transfer Rates."

The DOE STTR program was initially popular with small businesses. The Department received 664 grant applications from small businesses in the first 2 years of the program, FY 1994 and FY 1995. The number of applications dropped precipitously to 148 for FY 1998 and FY 1999 combined. The Department experienced some difficulty fully allocating the STTR set-aside for high quality collaborative research.

The Department addressed this problem in the following way: DOE issued the STTR solicitation with the SBIR solicitation and permitted small businesses to submit an STTR grant application to any of the 45 technical topics that were also available for SBIR. (In recent years, the STTR program solicitation issued by the Department of Energy typically contained between five and eight topics.) In addition, DOE permitted small businesses to submit the same grant application to both SBIR and STTR, provided the grant application met all statutory requirements. The number of STTR grant applications submitted increased to 302 for FY 2000 and FY 2001 combined, a 100 percent increase over the previous 2-year period.

DOE would encourage this Committee to consider increasing the Phase II award amount from $500,000 to $750,000, the same amount as for SBIR. The Department believes that the current STTR Phase II award amount of $500,000 stifles small business interest in the program, especially since the small business must share between 30 and 60 percent of that award with a research institution.

The STTR program is accomplishing its objectives. Based on the experience at DOE, STTR is proving to be an effective mechanism for combining the scientific and technical expertise of researchers at National Laboratories and universities with the commercialization skills and the incentives of small businesses to develop products and processes for the marketplace.

Thank you again, Mr. Chairman and members of the committees, for the opportunity to testify before you today. I would be pleased to answer your questions.

TESTIMONY OF ANTHONY CAMAROTA

Mr. Chairman, members of the Committee, I am Tony Camarota, President of Avtec Industries of Hudson, Massachusetts. I want to thank you for inviting me to testify before you today, and to speak about the Small Business Technology Transfer Program.

First I would like to express my gratitude and that of thousands of other small business owners to the Committee for initiating the STTR program in 1992 and for its steadfast support for a program that consistently is to the benefit of small busi-

ness and to the nation. While Avtec Industries, a relatively young enterprise, has just begun to mine the promise of this program; I am here today to offer you an amalgam of comments from small business owners like myself from around the nation. Among these are Wilson Composite Technologies of Folsom, California, Brewer Science, Inc of Rolla, Missouri, and Foster-Miller, Inc. of Waltham, Massachusetts.

Avtec Industries is in a unique position in that we are exemplary of the kind of firms that seek to mine University research and bring it to market. We rely heavily upon University researchers and their expertise to help us to perfect the products we produce and to conduct the tests and related qualification work that is necessary in order to gain produce acceptance.

AVTEC INDUSTRIES COMPANY PROFILE

Avtec Industries was founded in 1998. Its founding heralded the commercialization of a family of fire resistant coatings and resin additives that have their origin in the development aerospace products. Avtec's products are currently being examined by firms engaged in manufacturing of fiber optic cable, turbine engines, commercial and military aircraft, and civil and military maritime structures including oil and gas drilling platforms and ships. In the last year we signed 22 nondisclosure/teaming agreements and 425 restricted sample utilization agreements with fortune 1,000 firms involving the testing and certification of our products. Avtec Industries has three manufacturing sites, two in Massachusetts and one in New Hampshire. Avtec's is ISO 9000 certified, and has distributorships in the US, Europe and Asia. The STTR is a program that enables us to meet them myriad needs of this diverse customer base. As you might imagine, small firms such as our own lack the facilities and in-house expertise necessary to meet all of today's demanding market requirements. The STTR program helps us foster the relationships we need, and more importantly, to obtain the resources we must have to stay competitive.

By way of example, a DoD funded not-for-profit institution is teamed with Avtec in pursuit of an Advanced Technology Program award administered by NIST. We are also teamed with a prominent local defense contractor in pursuit of several SBIR grants. And finally we are teamed with one of the nation's premier materials and engineering schools involving other federal R&D grant programs.

KEY RECOMMENDATIONS

I want to make six recommendations that I feel will enhance the STTR program.

First, increase the STTR funds base from 0.15% to 1.5% of participating Agency's extramural budgets.

Second, increase the Phase II awards to $750,000.00 to bring the program into alignment with the true cost of research and development activities.

Third, increase the industry participation criterion from a minimum of 40% to between 50%–60%.

Fourth, ensure that project reviewers place equal emphasis on the commercialization plan as they do on the research plan.

Fifth, require that Universities, government laboratories and not-for-profit institutions treat STTR research product as company confidential business information unless otherwise released from those strictures by their business partner.

Sixth, to the extent possible, SBA and STTR program offices should provide small businesses with examples of successful strategies that resulted in Universities, government laboratories and not-for-profit institution partners (1) hewing to schedule(s), (2) staying within budget and (3) delivering what has been asked for. In this vein, SBA and Program offices should be encouraged to impress upon these partners the need under this program to hew to these principles.

I believe the first two recommendations speak for themselves, so I will not elaborate on them other than to say that we strongly support the program and want to see it expanded.

With respect to the other four recommendations, let me elaborate.

TEAMING WITH UNIVERSITIES, GOVERNMENT LABORATORIES AND NOT-FOR-PROFIT INSTITUTIONS

In all of our dealings we work with Universities such as the University of Massachusetts at Lowell, the University of Missouri at Rolla, MIT and others to access expertise and facilities we do not have or do not need. While our primary focus is on near-term answers to pressing technical matters, we also use these relationships to seek out promising early-stage University research. And while the time-to-market between our products and their research may be enormous, we are patient pursuers. Our success, while encouraging, has been augmented through programs such as this for it has lead to relationships with large firms we might not otherwise have estab-

lished. In a similar vein, it is through our University collaborations that we obtain critical insight into technological developments and make contacts with other firms that lead to alliances such as those I just described.

The STTR program which focus on university, government laboratory and not-for-profit launched endeavors can also work well for firms such as our own. If I may let me relay some thoughts from other firms with whom we work, but which could not be here. I won't ascribe these thoughts to any one firm, as they are an amalgam of many thoughts.

First and foremost, let me leave you with what may appear as a gratuitous thought yet one I believe is critical to the success of the program. It concerns the distribution of resources under the STTR program. STTR contracts establish minimum allocation ratios for resources and work-share between firms. Universities, government laboratories and not-for-profit institutions that require that small business participants receive at least 40% of any work and their partners a minimum of 30%. At a time when Congress is seeking a greater return on investment from the commercialization of technologies, our collective recommendation is to increase the proportion of the small business share to between 50%–60%. We make this recommendation because the full force of the commercialization burden rests upon our shoulders. Our colleagues in the University, government laboratory and not-for-profit communities are the guiding lights when it comes to technology development and for that they most certainly deserve praise, but the demands of Congress and of the market place have increased our burdens so we feel the time is ripe for a change in the resource allocation formula.

Second, unlike the SBIR program or other competitive procurements, Universities, government laboratories and not-for-profit entities play a significant role in evaluating STTR proposals. This is understandable, and in most cases is to be applauded, but I want to call your attention to a potential flaw that arises when researchers predominate the reviewer pool—often times emphasis is placed on matters concerning science and too little on its conversion to products and services. In other words, we see a strong bias in favor of basic research over either applied research, or the commercialization of product and services. In a case I am familiar with the company whose technology a government agency rated as the best in its market lost a Phase I bid because the reviewer had no knowledge of the company's business, the size and prowess of its commercialization teaming partners. the reviewer actually failed the proposal on the grounds that the commercialization plan was weak, when among the competitors the sponsoring agency listing it as the best. In the words of the sponsoring agency the Phase I award "went awry". Is this a case of deliberate bias? I don't know, but it does highlight the need for better administration of the criteria reviewers must use when making award recommendations.

Third, with respect to the handling of proprietary data I must tell you that at times I feel as though the bulk of my energies are spent on ensuring that our partners understand and respect the need for confidentiality. Tensions between our cultures is most pronounced when dealing with university partners whose requirements to "publish or perish" can threaten the sanctity of our privileged position vis-à-vis a technology or market. In an era when industrial might is determined as much by who gets to market first as by price we need to be doubly sure that all of our partner's respect our position on this matter. A casual comment, or lapse of discretion can compromise millions of dollars of investments, amounts few small businesses can absorb and recover from. Thus, we recommend that Universities, government laboratories and not-for-profit entities be required by law to treat STTR research product as strictly confidential unless otherwise released from those structures by their business partner. While this is certainly the intent of the program and of the implementing guidance provided by SBA, it is honored as much in the breach as it is adhered too. I do not believe that this will affect the outcome of the current Government Performance Review Act (GPRA) reporting requirements, as participating businesses must still relate their commercialization successes, or lack thereof.

In keeping with this theme I would also like to emphasize that a great deal of effort and money is required to perfect a product and make it market ready. Thus, a technological setback has as much market value as does a success. That is because every step along the way can act as a guide to our progress. As you might imagine our competitors will surely benefit if that information is made readily available.

Fourth, while some may argue that STTR grants are less likely to result in commercialized products and services than research sponsored through direct competition, SBIR awards, IR&D, etc., I believe the program has as much potential as any other and is what you make of it. However, let me relate how the program could be enhanced just a bit further. I feel that small businesses such as our own would benefit from training that would provide us with strategies for getting the most out

of University, government laboratories and not-for-profit partners. I don't mean to sound jaundiced or ungrateful, but I feel, as do a great many small businesses, that University, government laboratory and not-for-profit researchers are held to a different standard than are we. This means that hewing to schedule, staying within budget and doing what has been asked are considered options within the esteemed halls of academia, while to those of us in business they are something else entirely. Now I do not presume that the Congress can mandate cultural changes, but I do suggest that if by chance strategies have been developed to address these differences they be shared more broadly. Similarly, I encourage the SBA and STTR program offices to work with University, government laboratories and not-for-profit institutions to emphasize the need for close adherence to these principles.

Mr. Chairman, that concludes my comments. I want to thank you for providing me with an opportunity to come before you today. I would be happy to answer any questions you or the Committee may have.

TESTIMONY OF RICHARD W. CARROLL

I want to first thank the chairman, ranking minority member, and the committee for the opportunity to testify about my company's experience with the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs.

My name is Richard W. Carroll, and I am Chief Executive Officer (CEO) of Digital System Resources, Inc. (DSR) with headquarters here in Virginia, and offices in California, Florida, and Hawaii. My company started in 1985 like so many SBIR and STTR companies with eight people working out of a townhouse in Fairfax County just a few miles from here. Today, DSR is the 50th largest Department of Defense contractor for research and development. Simply put, this phenomenal success would not have possible without the SBIR and STTR programs.

DSR has, over the past 15 years, won SBIR and STTR Phase I and Phase II competitions that have resulted in commercial Phase III contracts totaling over $350 million. At the same time, we have developed sonar system processing for the Navy that have allowed our submarine fleet to significantly improve acoustic superiority over any potential opponents and has been highlighted by the submarine force as the submarine system providing the highest return on investment of any submarine program.

I repeat that we could not have accomplished all this without the SBIR and STTR programs. I believe that these two programs provide the only viable avenue for small high-tech companies to compete for defense and development contracts.

As I am sure the Committee is aware, over the past decade the defense marketplace has changed dramatically. Overall defense budgets have been cut and funding for research and development has also been sharply reduced. In this much smaller defense marketplace, we see even the largest defense contractors competing aggressively for even the smallest pots of advanced technology research and development dollars. We have also seen the large companies substantially reducing their high technology subcontracting. In general, the defense marketplace has changed to make it significantly more difficult for small high-tech businesses to compete for advanced defense research and development.

On the other hand, the defense technology environment has changed radically in ways that should be more suitable for small business solutions. A revolution in technology is taking place in the private sector fueled by innovative small high-tech businesses. The private sector has overwhelmingly demonstrated that you don't have to be a giant manufacturer of complex systems in order to provide innovative solutions to complex problems. With an increasingly acute requirement to modernize aging weapon systems, the Department of Defense should be actively soliciting small high-tech businesses to provide innovative, cost-effective solutions to many of its most complex military system requirements.

The SBIR and STTR programs are now more essential than ever. They offer a unique and effective structure for introducing advanced technology solutions developed by small business for the defense marketplace. The SBIR and STTR programs offer a "fly before you buy" approach that gives small businesses seed money to rapidly develop and demonstrate the viability of advanced technology concepts before any commitment has been made to purchase the technology. In addition, these programs provide small business protections and follow-on procurement opportunities that ensure enthusiastic and motivated small business participation.

My own company's success story started with two SBIR contracts awarded from the Navy in 1991. DSR was able to explore the application of commercial off-the-shelf computer hardware for the data processing needs of the Navy's advanced sub-

marine sonars. Over the past ten years, this effort has led to the development of the Multipurpose Processor (MPP) that has become the sonar data processor for our submarine fleet. In addition, we have developed a rapid technology insertion program built around the MPP that is providing upgrades to the system on an annual basis rather than the 8 to 10 year upgrade cycles of the sonar systems that the MPP replaced. The MPP cost one-tenth of what the system it replaced cost to develop; the systems we build cost one-thirtieth of those they replaced; and the MPP provides 200 times the processing capability of the sonar data processors they replaced. Finally, we are seeing the strategic undersea surveillance system and the surface Navy adopting this sonar processor for their sonar data processing requirements.

The SBIR and STTR program are designed to encourage innovation and take advantage of emerging technologies. These programs provide an unparalleled opportunity to explore technology opportunities that have huge potential rewards without the participating agency spending huge amounts of money. After all, the Department of Defense spends only $100,000 for a Phase I technology exploration and just $750,000 to develop and demonstrate a technology in Phase II. At that point, the Department can evaluate the applicability of a technology before commercializing it in Phase III. These are bargain prices for research and development.

Our experience in the STTR program has been very similar to that in the SBIR program though for DSR, we have relied more heavily on the SBIR program than the STTR. We successfully teamed with Duke University in Durham, North Carolina, on an STTR effort to develop composite embedded antennas for electronic warfare. We won both Phase I and Phase II contracts with Duke developing the antenna hardware and DSR developing the application software. The characteristics of the STTR relationship in our case was to bring the basic research orientation of Duke together with the applied technology focus of DSR which was seeking to market the technology to DoD. This partnership stimulates "out-of-the-box" thinking at both the university and the company through mutual exposure to new ideas that might not naturally germinate in our respective environments. We firmly believe that this partnership can stimulate the transition from basic research in the university environment into the commercial marketplace. An added benefit for our company is direct access to a proven source of professional talent, and we provide students working on the STTR projects with employment opportunities in their chosen fields.

The results of our embedded antennas Phase I and Phase II efforts with Duke University was an agreement with the Navy's Space Warfare Command for Phase III funding to further develop the technology for possible inclusion in the Navy's Advanced Integrated Electronic Warfare System (AIEWS). The software that DSR was developing in conjunction with the STTR project and the requirements definition carried on in that process contributed substantially to DSR winning Phase III contracts for a major portion of the AIEWS program. This Phase III AIEWS business has accounted for over $30 million in DSR revenue.

The STTR program is a natural complement to the SBIR program in that it generally involves more basic research while still providing all the advantages and opportunities that come from the SBIR program. The STTR program is an essential adjunct to the SBIR program for small business research and development. It should be reauthorized just as the SBIR program was reauthorized last year.

In closing, I want to commend the Committee for its unwavering support for both the SBIR and the STTR programs. These programs are essential to give small businesses a realistic opportunity to compete in the defense marketplace. I believe that without these two programs, injecting small business innovation into the Department of Defense would be virtually impossible.

Again, thank you for the opportunity to testify. I look forward to answering any questions you may have.

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